NON-PUBLIC?: N
ACCESSION #: 9112300066
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Beaver Valley Power Station Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000412

TITLE: Reactor Trip Due To Spurious Component Actuation
EVENT DATE: 11/26/91 LER #: 91-005-00 REPORT DATE: 12/23/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: T. P. Noonan TELEPHONE: (412) 643-1258
General Manager Nuclear Operations

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JJ COMPONENT: RLY MANUFACTURER: W120
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 11/26/91, with the Unit in Power Operation at 100 percent reactor power, a load rejection (closure of the governor and interceptor valves) occurred at 1143 hours. The closure of the governor and interceptor valves was the result of a signal from the Overspeed Protection Control (OPC) circuit. The load rejection caused a rapid reactor coolant sy
tem
(RCS) heatup of three degrees. The control rods, in automatic, began to step into the core, however, a reactor trip on power range neutron flux negative rate occurred at 1143 hours. This trip was the result of the combined effects of the reactor fuel (doppler) and moderator temperature coefficients due to the RCS heatup resulting from the load rejection. Operations personnel stabilized the plant in Hot Shutdown. An investigation revealed that a solid state relay in the OPC circuit inadvertently actuated causing the load rejection. The failed relay was replaced. There were no safety implications as a result of this event.

The reactor control system and the auxiliary feedwater system actuated as designed upon receipt of the reactor trip signal and low-low steam generator level signals.

END OF ABSTRACT

DESCRIPTION OF THE EVENT

On 11/26/91, with the Unit in Power Operation (Operating Mode 1) at 100 percent reactor power, a load rejection (closure of the governor valves and interceptor valves) occurred at 1143 hours. The closure of these valves was the result of a signal from the Overspeed Protection Control (OPC) circuit. The OPC circuit functions to mitigate a turbine overspeed condition (103 percent of rated speed).

The load rejection resulted in a near instantaneous reactor coolant system heatup of three degrees. The condenser steam dump system, sized to accommodate eighty-five percent of the steam flow, actuated in response to the governor valve closure to maintain an artificial steam load on the reactor coolant system. The control rods, in automatic, began to step into the core, however, a reactor trip on power range neutron flux negative rate (-5 percent/minute) occurred at 1143 hours. This trip occurred due to a negative reactivity addition of approximately 85 pcm as the result of the combined effects of the reactor fuel (doppler) and moderator temperature coefficients due to the RCS heatup resulting from the load rejection. As a result of the reactor coolant system heatup and corresponding pressure increase, a pressurizer power operated relief valve (setpoint of 2335 psig) actuated for three (3) seconds. Following the reactor trip, steam generator levels decreased to the low-low level values, as expected, resulting in the automatic start of the auxiliary feedwater pumps. Operations personnel stabilized the plant in Hot Shutdown (Operating Mode 3).

CAUSE OF THE EVENT

The cause of the event was a failed solid state relay in the OPC circuit, which generated a spurious OPC signal causing closure of the governor and interceptor valves. There were no actual OPC actuation signals present to initiate the event. Subsequent testing on the relay confirmed that it was passing high leakage current when subjected to test voltages of 130 VDC and 240 VDC.

CORRECTIVE ACTIONS

The following corrective actions have been or will be taken as a result of this event:

1. Operations personnel stabilized the plant in Hot Shutdown (Operating Mode 3).

2. The failed OPC relay was tested and found to be defective. A spare relay was tested to confirm proper operation and was installed in place of the failed relay.

3. The OPC circuit involving the failed relay was checked for presence of grounds, however no indication of a ground was detected.

4. A design change to reduce the probability of a load rejection upon a failure of this specific relay will be evaluated for implementation at a future outage.

REPORTABILITY

This event was reported to the Nuclear Regulatory commission via the Emergency. Notification System in accordance with 10CFR50.72.b.2.ii, as automatic actuation of the reactor protection system. This written report is being submitted in accordance with 10CFR50.73.a.2.iv, as an event involving a reactor protection system actuation and an engineered safety features (ESF) system actuation (automatic start of the auxiliary feedwater system).

PREVIOUS OCCURRENCES

There were no previous similar events.

SAFETY IMPLICATIONS

There were no safety implications to the public as a result of this event. The reactor protection system functioned as designed to provide control rod insertion upon receipt of a reactor trip signal. The condenser steam dump system functioned to maintain an artificial secondary system steam load, however the reactivity effects from the reactor coolant system temperature rise resulted in the reactor trip. Plant response for this type of event is detailed in the Updated Final Safety Analysis Report (UFSAR) Section 15.2.2 "Loss of External Electrical Load". The auxiliary feedwater pumps automatically started to provide feedwater to the steam generators upon reaching the low-low level

setpoints (this is an expected condition resulting from "shrink" following a reactor trip).

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Nuclear Group
P.O. Box 4
Shippingport, PA 15077-0004 December 23, 1991
ND3MNO:3230

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 91-005-00

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical specifications, the following Licensee Event Report is submitted:

LER 91-005-00, 10 CFR 50.73.,a.2.iv, "Reactor Trip Due to Spurious Component Actuation".

Very truly yours,

T. P. Noonan
General Manager
Nuclear Operations

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Attachment

December 23, 1991
ND3MNO:3230

cc: Mr. T. T. Martin, Regional Administrator
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